SHIFT OF MODAL TONIC IN RELATION TO SIMPLE AND COMPLEX REPETITIVE RAGAS IN KARNATAK MUSIC

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Introduction

The present Indian classical systems of music, both Karnatak and Hindusthani musics are based on *Adhara Shadja*. In A*dhara Shadja* system any pitch is taken as the tonic note with respect to which other notes, *srutis* and microtones get fixed.

In the present system of music if the *Adhara Shadja* is shifted, new *ragas* will automatically result. Here it may be clarified that only some of the *Melakartas* yield new *Melakartas* by shift of modal tonic. These are called *Murchanakaraka melas* and the remaining are called *Amurchanakaraka* or sterile *ragas*. (Sambha Murty—1963 Vol.-V Pp. 84).

In the shift of modal tonic of *Murchanakanaka ragas*, a *melakarta* yields a *melakarta*, a *shadava raga* to a *shadava raga*, an *audava raga* to an *audava raga* and a *swaratara raga to* a *swarantra raga*. Prof. Sambha Murty deserves appreciation for discussion at length about this subject (South Indian Music Book-III & Book-IV).

It is beyond the scope of this article to deal with the topics already covered by Prof. Sambha Murty. The scope of the present article is to present some aspects of shift of modal tonic in relation to simple and complex repetitive *ragas* of *Audava* and *Shadava* type.

Simple Repetitive Ragas

A repetitive raga is a *raga* claiming more than one parent *mela*. Due to

eschewing of common notes, a *raga* can be ascribed to more than one *Janaka raga* taking *swarasthanas* into consideration.

For example *Hamsadhwani* with Sa Ri Ga Pa Ni Sa—Sa Ni Pa Ga Ri Sa of *Sankarabharana Swaras* respectively can be derived from *Sarasangi* (27), *Dhira Sankarabharanam* (29), *Naganandini* (30), *Latangi* (63), *Mecha-kalyani* (65) and *Chitambari* (66), because all of the said *ragas* differ with respect to one another in relation to Ma or Dha or both.

Late Prof. Sambha Murty evolved 14 principles of repetition (South Indian Music Book III).

The author of this article modified some of the incorrect principles of repetition of Sambha Murty and presented in detail (*Sangeet-Natak*-38, 1975).

The shift of modal tonic in relation to simple repetitive *ragas* will be discussed later on.

Notation Used

While giving the examples of ragas, the following notation is used in the article so that by the mere mention of the arohana and avarohana, the raga can be ioagined by the reader.

Sa	*Shadja*	—	(*Madhyama Sthayi*)
Ri_1	*Suddha Rishabha*	—	,,
Ri_2	*Chatussruti Rishabha*	—	,,
Ri_3	*Shatsruti Rishabha*	—	,,
Ga_0	*Suddha Gandhara*	—Ri_2	,,
Ga_1	*Sadharana Gandhara*	—Ri_3	,,
Ga_2	*Antara Gandhara*	—	,,
Ma_1	*Suddha Madhyama*	—	,,
Ma_2	*Prati Madhyama*	—	,,
Pa	*Panchama*	—	,,
Dha_1	*Suddha Dhaivatam*	—	,,
Dha_2	*Chatussruti Dhaivatam*	—	,,
Dha_3	*Shatsruti Dhaivatam*	—	,,
Ni_0	*Suddha Nishadham*	—Dha_2	,,
Ni_1	*Kaisiki Nishadham*	—Dha_3	,,
Ni_2	*Kakali Nishadham*	—	,,
Sa	*Shadja*	—*Tara Sthayi.*	

The number given in brackets at the end of *ragas* indicates the order of the *melakanta* according to Katapayadi formula. *Upanga raga* refers to *Audava* and *Shadava ragas*.

Complex Repetitive Ragas

In order that the reader may appreciate the shift of modal tonic in relation to complex repetitive *ragas*, the author feels the necessity of presenting the concept of complex repetitive *ragas*, in some detail.

This is a new concept proposed by the author (Music Academy Journal —In Press).

Before presenting the definition of a complex repetitive *raga* and principles of complex repetition, some examples are presented below to grasp the concept.

Raga Mohan has Sa Ri_2 Ga_2 Pa Dha_2 Sa—Sa Dha_2 Pa Ga_2 Ri_2 Sa in the *Arohana* and *Avarohana* respectively. Most of the books mention it as the *Janya raga* of *Harikambhoji* (28), since it is a repetitive *raga* it can be ascribed to any of *Melakartas* namely *Harikanbhoji* (28), *Dhirasankarabharanam*(29), *Vachaspati* (64), *Mechakalyani* (65) (Sambha Murty Vol.-III, 1974) and P.S.N. Murti (*Sangeet Natak* Vol. 38—1975).

However when proper thought is given, *Mohana raga* can be derived from other *Melakartas* also. Let the *ragas Mara Ranjani* and *Kantamani* be considered.

Sa *Ri_2* *Ga_2* *Ma_1* *Pa* *Dha_1* *Ni_0* *Sa* — *Arohana*
Sa *Ni_0* Dha_1 *Pa* *Ma_1* *Ga_2* *Ri_2* *Sa* — *Avarohana*

The above is the *arohana* and *avarohana* for *Mararanjani* (25).

Sa *Ri_2* *Ga_2* *Ma_2* *Pa* Dha_1 *Ni_0* *Sa* — *Arohana*
Sa *Ni_0* Dha_1 *Pa* *Ma_2* *Ga_2* *Ri_2* *Sa* — *Avarohana*

The above is the *arohana* and *avarohana* for *Kantamani* (61).

From the above two *melakartas* the notes with underlines may be considered.

Sa *Ri_2* *La_2* *Pa* *Ni_0* *Sa* — *Arohana*
Sa *Ni_0* *Pa* *Ga_2* *Ri_2* *Sa* — *Avarohana*

It is already clarified in the earlier pages that $Dha_2 = Ni_0$, $Dha_3 =$ Nil, $Ri_2 = Ga_0$ and $Ri_3 =$ Ga1.

Therefore the *audava audava raga* is same as *Mohana raga* except for the fact Dha is pronounced as Ni. It matters little for the instrumentalist as well as the vocalist because what matters is the frequency of notes but not the letters.

In Indian Music notation Sa, Ri, Ga, Ma, Pa, Dha, Ni are used for *swaras*. In western music Do, Re, Mi, Fa, Sol, La, Te are used for the same *swaras*. But music is not going to change on account of using different notations in different systems of music. What exactly count in music are the relative pitch relations of notes.

By the arguments given above, *Mohana raga* apart from *Harikambhoji* (28), *Dhira Sankarabharanam* (29), *Vachaspati* (64) and *Mechakalayani* (65) can be derived from *Mararanjani* (25) and *Kantamani* (61).

But to derive this *raga* from *Mararanjani* (25) and *Kantamani* (61) it has to be conceived that $Ni_0 = Dha_2$. It is not readily evident as in other cases.

Hence it is repeating in a complex way in Mararanjani (25) and *Kantamani* (61), where as it is repeating in *Harikambhoji* (28), Sankarabharana (29), *Vachaspati* (64) and *Kalyani* (65) in a simple way.

Therefore the term complex repetitive *raga* was coined by the author (Music Academy Journal—in Press).

Definition of A Complex Repetitive Raga

A complex repetitive *raga* is a *raga* which can be derived from a *Melakarta* by changing the name of the one of two *swaras* but not the frequencies. In other words one or more *swaras* may be used as *Vivadi Swaras* (*Vikriti Swaras* according to some) with the same frequency.

In order to appreciate the shift of modal tonic in relation to complex repetitive *ragas*, the principles of their repetition is presented below.

Principles of Repetition of Complex Reptitive Ragas.

(1) A *Sampurna—Sampurna* or *Sampurna—Shadava* or *Shadava—Sampurna-Audava* or *Audava-Sampurna raga* can not give rise to any complex repetitive *raga*.

(2) A *Shadava-Shadava raga* can have complex repetitive *raga* but only one repetition is possible.

(3) A *Shadava-Shadava* having Ri, Ga, Da, Ni in the *Ardhana* and *Avarohana* can not have any complex repetitive *raga*.

(4) Any *Shadava-Shadava raga* without *Madhyama* can not give rise to a complex repetitive *raga* (That is same principle as No. 3).

(5) In any *Shadava-Audava or Audava-Shadava raga* only one complex repetitive *raga* is possible.

(6) When an *Audava-Audava* or *Audava-Shadava* of *Shadava-Audava* is such that all the *swaras* of a *Melakarta* are covered taking *Arohanai Avarohana* together, can not give rise to a complex repetitive *raga*. For example a combination like Sa Ri Ga Ma Pa Sa—Sa Ni Da Pa Ma Sa, can not give rise to a complex repetitive *raga*.

(7) A *raga* must have one or more of its *swaras* from Ri Ga Da Ni to become a complex repetitive *raga*, of course subject to principles 1-6.

(8) All complex repetitive *ragas* must also be simple repetitive *ragas* in nature (Eg. *Mohana, Suddha Saveri, Madhyamavati, Chandrajyoti* etc). But all the simple repetitive *ragas* need not be complex in nature. (For example *Hamsadhwani* is a simple repetitive *raga* but not a complex repetitive *raga*). Only in certain *ragas* complex repetitions are possible.

(9) In any *Audava-Audava raga* the maximum complex repetitions can be 5 in number.

(10) Any *raga* can not repeat more than 9 times taking simple and complex repetitions into consideration.

Number of Complex Repetitive Ragas.

The following are the details about the lower limit of the number of complex repetitive *ragas*.

Sl. No.	Name of Raga type.	Minimum number of possible complex repetitive ragas.
1.	*Shadava-Shadava*	24
2.	*Shadava-Audava*	120
3.	*Audava-Shadava*	120
4.	*Audava-Shadava*	968
	Total :	1232

Shift of the Modal Tonic

When the *Adhara Shadja* of a *raga* is shifted (*e.g.* Ri is taken tonic note) redistribution of intervals among the *swaras* takes place and a new *raga* will emerge. In the case of a *raga* what is important is the intervals between the notes and their relation with respect to the tonic note.

Prof. Sambha Murty considered the topic of shift of Modal tonic under the head *Murchanakara Janya ragas* in some detail (South Indian Music

Book V-1963). For determining the form of *Jnya raga* resulting from the shift of tonic note he suggests the following method. For determining the form of *Janya raga* resulting from the shift of the tonic note, determine its *arohana* and *avardhana* and its *Janaka mela.*

"For example if the Ni *Murchana* of *Dhanyasi* is to be determined, find out the Ni *menchana* of its *Sampurna arohana.* This gives us 22nd *mela.* Since *Dhanyasi* is an *Upanga raga,* the new *raga* must belong to 22nd *mela.* The Ni *murchana* of the *arohana* S G M P N S gives us the *arohana* S R M P D S. Thus the resulting *raga* is *Salaga Bhairavi* a derivative of *Kharahara Priya mela/"*

Paradox in the Method

The above procedure suggested by Prof. Sambha Murty for determining the form of a *Janya raga* holds good generally only. This aspect will become clear when we study a few examples.

Let*Mo hana raga* Sa Ri_2 Ga_2 Pa Dha_2 Sa—Sa Dha_2 Pa Ga_2 Ri_2 sa in the *arohana* and *avarohana* be considered. It is a *sarva swara Murchanakaraka Janya raga.* Its parent *mela* is generally stated as *Harikambhoji* (28). Prof. Sambha Murty also considered it as derived from *Harikanbhoji* (28) under *Murchanakaraka Janya ragas* in the Table IX (Pp. 98-99 South Indian Music Book V-1963).

The Ri *murchana* of *Mohana raga* gives rise to *Madhyamavati* Ga *murchana* to *Malkaus,* Pa *murchana* to *suddha saveri* and Da *murchana* to *udaya Ravi chandrika.*

Mohana raga is a repetitive *raga* (Sambha Murty 1963, P S N Murty 1975), derived from the following *Melas Harikambhoji* (28), *Dhira Sankara-bharanam* (29), *Vachaspati* (64), and *Mechakalyani* (65). These four *melas* are *Murchanakaraka Janaka ragas,* of course with respect to certain notes only.

Basic raga	*Ragas resulting by the shift of tonic note.*			
	Ri.	Ga.	Pa.	Dha.
Harikambhoji (28)	20	—	22	8
Dhira Sankarabharanam	22	8	28	20
Vachaspati	26	—	23	10
Mechakalyani	28	20	29	22

The *Rishabha Marchana* of *Harikambhoji* results in *Nathabhairavi* (20) *Mela* whereas the *rishabha murchana* of *Mohana* results in *Madhyamavati.*

Applying the principle of Sambha Murty, *Madhyamavati* with Sa Ri_2

Ma_1 Pa Ni_1 Sa—Sa Ni_1 Pa Ma_1 Ri_2 Sa in the *arohana* and *avarohana* respectively, should be *Janya raga* or *Nathambhairavi mela* (20).

It may be interesting to note that Sambha Murty himself has shown the *Janaka Mela* of *Madhyamavati* as *Kharaharapriya* (22) whereas Ri—*Murchana* of *Harikambhoji* (28), the parent *mela* of *Mohana* results in *Nathabhairavi* (20).

This looks in consistant. However, it may be pointed out here that there is no inconsistency, when we apply the concept of repetitive *ragas*. For explaining the above examples principles of simple repetitive *ragas* will suffice.

Madhyamavati (Sa Ri_2 Ma_1 Pa Ni_1 Sa—Sa Ni_1 Pa Ma_1 Ri_2 Sa_1) is a repetitive *raga*. It is a Janya raga of *Nathabrairavi mela* (20) as well.

Sa *Ei*$_2$ *Ga*$_1$ *Ma*$_1$ *Pa* Dha$_1$ *Ni*$_1$ *Sa* — Arohana.
Sa *Ni*$_1$ *Dha*$_1$ *Pa* *Ma*$_1$ *Ga*$_1$ *Ri*$_2$ *Sa* — Avarohana.

Taking the underlined notes of *Nathabhairavi* (20) in the *arohana* and *avarohana* results in *madhyamavati*.

Taking *Ga* of *Harikambhoji mela* (28) as tonic note does not result in any of the 72 *Melakartas*. This aspect will be dealt later on.

Taking Pa of *Mohana* as tonic note results in *Suddhasaveri* which is mentioned under the *Janya ragas* of *Sankarabharanam* (29). For ready reference the table of the *Murchanakara Janyaragas* of Prof. Sambha Murty (Book V-1963 Pp. 98-99) is Table 1.

But Pa *murchana* of *Harimambhoji* results in *Kharahara Priya* (22). *Suddha saveri* with (Sa Ri_2 Ba_2 Pa Dha_2 Sa — Sa Dha_2 Pa Ga_2 Ri_2 Sa) is a repetitive *raga* and can be derived from *Kharaharapriya* also.

Similarly Dha *Gurchana* of *Mohana* results in *udaya kavi chandrika* which is mentioned as a *Janya raga* of *Kharahara priya* (22). But Dha *murchana* of *Harikanbhoji* results in *Janumathodi* (8). *Udaya Ravi chandrika* with (Sa Ga_1 Ma_1 P Ni_1 Sa — Sa Ni_1 Pa Ma_1 Ga_1 Sa) can be derived from *Hanumathodi* (8), apart from *Kharahara priya* (22).

The Ri *Murchana* of *Sdrkarabharanam* gives rise to *Kharahara priya* (22), which is the parent *mela* of *Madhyamavati*.

The *Ga Murchana* of (29) results in *Hanunathodi* (8) and from the principle of repetition, it can be parent *mela* for *Malkaus*.

The Pa *Murchana* of *Sankara-bharanam* results in *Harikambhoji* which can also be considered as *Janaka mela* for *suddha saveri*.

From the principles of repetitive *ragas, charukesi* (26), *Gauri Manohari* (23) and *Nataka Priya* (10) can also be considered as *Janaka melas* for *Madhyamavati, Suddha saveri* and *udaya ravi chandrika* respectively.

The Ri *murchana* of *kalyani* results in *Hari Kambhoji* (28), which can also be considered as parent *mela* for *Madhyamavati* from the principles of repetitive *ragas*.

Simple and Complex Repetitions in Madhyamavati—Sudda Saveri.

The following are the *arohana* and *avarohana* of *Madhyamavati* and *suddhasaveri*.

Sa	*Ri_2*	*Ma_1*	*Pa*	*Ni_1*	*Sa*	— *Arohana*	) *Madhyama-*
Sa	*Ni_1*	*Pa*	*Ma*	*Ma_1*	*Sa*	— *Avarohana*	) vati.
Sa	*Ri_2*	*Ma_1*	*Pa*	*Dha_2*	*Sa*	— *Arohana*	) *Suddha*
Sa	*Dha_2*	*Pa*	*Ma_1*	*Ri_2*	*Sa*	— *Avarohana*	) *Saveri*

From the simple principles of simple repetition, *Madhya mavati* is derived from *Nathabhairari* (20) *Charukesi* (26), *Kharaharapriya* (22) and *Harikambhoji* (28).

Madhyamavati can be derived from the following *Melakartas* also namely namely *Ratnangi* (2), *Vanaspati* (4) *Varunapriya* (24), *Naganandini* (30), *Tanarupi* (6), by applying the principles of comples repetition, by taking the underlined notes in the *arohana* and *avarohana* respectively.

Sa	*Ri_1*	*Ga_0*	*Ma_1*	*Pa*	*Dha_1*	*Ni_1*	*Sa*	— *Arohana*) *Ratnangi* (2).
Sa	*Ni_1*	*Dha_1*	*Pa*	*Ma_1*	*Gao*	*Ri_1*	*Sa*	— *Avarohana*
Sa	*Ri_1*	*Gao*	*Ma_1*	*Pa*	*Dha_2*	*Ni_1*	*Sa*	— *Arohana*) *Vanaspati* (4)
Sa	*Ni_1*	*Dha_2*	*Pa*	*Ma_1*	*Ga_0*	*Ri_1*	*Sa*	— *Avarohana*)
Sa	*Ri_2*	*Ga_1*	*Ma_1*	*Pa*	*Dha_3*	*Ni_2*	*Sa*	— *Arohana*) *Varunapriya*
Sa	*Ni_2*	*Dha_3*	*Pa*	*Ma_1*	*Ga_1*	*Ri_2*	*Sa*	— *Avarohana* (24).
Sa	*Ri_2*	*Ga_2*	*Ma_1*	*Pa*	*Dha_3*	*Ni_2*	*Sa*	— *Arohana*) *Naganandini*
Sa	*Ni_2*	*Dha_3*	*Pa*	*Ma_1*	*Ga_2*	*Ri_2*	*Sa*	— *Avarohana*) (30).
Sa	*Ri_1*	*Ga_0*	*Ma_1*	*Pa*	*Dha_3*	*Ni_2*	*Sa*	— *Avarohana*) *Tana Rupi*
Sa	*Ni_2*	*Dha_3*	*Pa*	*Ma_1*	*Ga_0*	*Ri*1	*Si*	— *Avarohana*) (6)

From the above examples it is clear that *Melakartas* (2, 4, 24, 30, 6) can give rise to *Madhyamavati* from the principles of complex repetition.

Suddha saveri is derived from *Melakartas* 22, 23, 28, 29 from the principles of simple repetitive *ragas* from *Melakartas* 4, 5, 19, 25 & 1 from the principles of complex repetition.

Though *Suddha saveri* can be derived from 9 *Melas*. most of the books

TABLE 1

Murchhanakaraka Janya Ragas

(After Prof. P. Sambha Murty)

Name of the basic raga.	Serial No. of its mela.	Its arohana and avarohana.	Ragas resulting by the shift of the tonic note						
			s	r	g	m	p	d	n
Dhanyasi	8	sgmpns—sndpmgrs.							Salagabh-airavi.
Desya todi	8	sgmpdns—sndpmgrs.			Kambhoji				
Suddha todi	8	srgmdns—sndmgrs.							Pushpala-tika.
Vasanta	17	sgmdns—sndmgrs.				Ramani.			
Malkaus	20	sgmdns—sndmgs.			Suddha saveri.	Udaya ravichandrika.		Mohana.	Madhyama-vati.
Udaya-ravichandrika	22	sgmpns—snpmgs.			Mohana.	Madhyama-vati.	Malkaus.		Suddha saveri.
Madhyamavati	22	srmpns—snpmrs.		Malkaus.		Suddha saveri.	Udaya-ravichandrika.		Mohana.
Pushpalatika	22	srgmpns—snpmgrs.		Suddha todi.					
Salagabhairavi	22	srmpds—sndpmgrs.		Dhanyasi.					
Abhogi	22	srgmds—sdmgrs.				Valaji.			
Abheri	22	sgmpns—sndpmgrs.			Mohana-kalyani.	Kedara-gaula.			Arabhi.
Mohana	28	srgpds—sdpgrs.		Madhya-mavati.	Malkaus.		Suddha saveri.	Udayara-vichandrika.	
Valaji	28	sgpdns—sndpgs.					Abhogi.		
Nagasvaravali	28	sgmpds—sdpmgs.				Hamsadhvani.			
Kedaragaula	28	srmpns—sndpmgrs.				Arabhi.	Abheri.		

Yadukula-kambhoji	28	srmpds—sndpmgrs.		Bilahari.		
Kambhoji	28	srgmpds—sndpmgrs.				Desya todi.
Kuntalavarali	28	smpdnds—sndpms.		Budha-manohari.		
Hamsadhvani	29	srgpns—snpgrs.			Nagasvara vali.	
Suddhasaveri	29	srmpds—sdmprs.	Udayaravi-chandrika.	Mohana.	Madhyama-vati.	Malkaus.
Arabhi	29	srmpds—sndpmgrs.	Abheri.	Mohana-kalyani.	Kedara-gaula.	
Bilahari	29	srgpds—sndpmgrs.			Yadukular-kambhoji.	
Budhamanohari	29	srgmgps—spmgrs.			Kuntala-varali.	
Ramani	63	sgmpns—sndpmgs.			Vasanta.	
Mohanakalyani	65	srgpds—sndpmgrs.			Arabhi.	Abheri*

* Included by the author of this article.

mention it under the *Janya ragas* of *Dhira Sankaarabharanam*. Taking *Ragacchaya* into consideration, *Suddha saveri* forms a bondage *raga* with *Arabhi*. Since *Arabhi* is a *Janya raga* of *Szrkarabharanam* (29), it is appropriate to consider *Suddha saveri* also under the *Janya ragas* of 29th *Mela* (Murty P.S.N. 1977 Shanmukha Vol.-11, No. 2).

The Ma *murchana* of *Madhyamavati* gives rise to *Suddha saveri*. The *Janak Melas* of *Madhyamavati* and the resulting *ragas* by its Ma *murchana* are presented below.

Janak Melas of Madhyamavati		*Melas resulting by the Ma Murchana.*
Nathabhairayi (20)	—	*Kharaharapriya* (22).
Charukesi (26)	—	*Gauri Manohari* (23).
Kharaharapriya (22)	—	*Harikmbhoji* (28).
Harikambhoji (28)	—	*Dhira Sankarabharanam* (29).
Ratnangi (2)	—	*Jhanakra Dhwani* (19).
Vanaspati (4)	—	*Mararanjani* (25).
Varunapriya (24)	—	..
Naganandini (30)	—	..
Tana Rupi (6)	—	..

The Pa *murchana* of *Suddha saveri* gives rise to *Madhyamavati*. The *Janyaka Melas* of *Suddha saveri* and the resulting *ragas* by its pa *murchana* are presented below —

Janaka Melas of Suddha saveri.	*Melas resulting by the Pa murchana.*
Kharahara Priya (22)	*Nathabhairavi* (20)
Gaurimanohari (23)	*Charukesi* (26)
Harikambhoji (28)	*Kharaharapriya* (22)
Dhira Sankarabharanam (29)	*Hatikambhoji* (28)
Jhankaradhwani (19)	*Ratnangi* (2)
Mararanjani (25)	*Vanastpati* (4)
Vanaspati (4)	..
Manavati (5)	..
Kanakangi (1)	..

Thus it could be seen that 6 of the *Janaka Melas* of *Madhyamavati* give rise to 6 of the *Janka Melas* of *Suddha Saveri* by Ma *murchana*, and these resulting 6 *Janka Melas* of *Suddha Saveri* by Pa *murchana* give rise to 6 *Janaka Melas* of *Madhyamavati*. 3 each of the *Janaka Melas* of *Madhyamavati* and *Suddha saveri* are sterile with respect to Ma and Pa *murchanas* respectively.

The above is a case where a *raga* which claims 9 *Janaka Melas* by shift of modal tonic gives rise to another *raga* which also has 9 parent *Melas*.

Hamsadhwani—Nagaswaravali

Hamsadhwani has Sa Ri_2 Ga_2 Pa Ni_2 Sa—Sa Ni_2 Pa Ga_2 Ri_2 Sa in the *arohana* and *avarohana* respectively. Its parent *Mela* has been mentioned as *Dhira Sankarabharanam* (29) (Sambha Murty Vol.-IV 1963 and Eka Subba Rao 1968).

From the *ragachaya* point of view *Hamsadhwani* is the derivative of *Mechakalyani* (P.S.N. Murty, Shanmukha, Vol-II No. 4, 1977).

Since *Hamsadhwani* is a repetitive *raga*, it can be derived from *Saransangi* (27), *Dhirasankarabharanam* (29), *Naganandini* (30), *Latangi* (63), *Mechakal yani* (65), *Chitrambari* (66).

It is to be noted that *Hansadhwani* is only a simple repetitive *raga*. It has no complex repetitions. The Pa *murchana* of *Hamsadhwani* gives rise to *Nagaswaranali* with Sa Ga_2 Ma_1 Pa Dha_2 Sa — Sa Dha_2 Pa Ma_1 Ga_2 Sa in the *aroahana* and *avarohana* respectively. It is supposed to be derived from *Harikambhoji* (28) (Refer Table-I) Since it is a repetitive *raga* it can be derived from *Chakravakam* (16), *Suryakantam* (17), *Dhira Sankarabharanam* (29), *Vagadhiswari* (34), *Sulini* (35) apart from *Harikambhoji*, from the principles of simple repetition.

By applying the principles of complex repetition it can be derived from *Gayakapriya* (13), *Mararanjani* (25), *Yagapriya* (31).

The Ma *murchana* of *Nagaswaravali* gives rise to *Hamsadhwani*, which is only a simple repetitive *raga*. *Hamsadhwani* has 6 perent *Melas* where as *Nagaswaravali* has 9 parent *melas*.

The Ma *murchana* of the parent *melas* of *Nagaswaravali* (16, 17, 28, 29, 34, 35) give rise to *melas* (27, 63, 29, 65, 30, & 66) respectively which happen to be parent *melas* for *hamsadhwani*.

Similarly the Pa *murchana* of parent *Melas* of *Hamsadhwani* (27, 29, 63, 65, 30 & 66) give rise to parent *melas* of *Nagaswaravali* (16, 28, 17, 29 & 35) respectively.

The other three parent *melas* of *Nagaswaravali* (No. 13, 25 & 31) are *Anurchanakaraka melas* ith respect to Ma *murchana*. This aspect will be considered in the latter part of this article.

Therefore it follows that two Audava gragas which result in each other by the shift of modal tonic, can have different number of Janaka Melas. Their nature can also be different in that one can be a simple repetitive raga and the other can be a complex repetitive raga.

The Ri, Ga, Ni *murchana* of *Hamsadhwani* gives birth to other *Audava — Audava ragas* which are not yet named. The same is the case with *Nagaswaravali*. Its Ma *murchana* gives lirth to *Hamsadhwani* which is a known and popular *raga* Ga, Pa, Dha *murchanas* of *Nagaswaravali* give rise to *Audava-Audava ragas* which are not yet named. Even some of them are named, they are not popular. Example is given below for *Nagaswaravali*.

Ga *Murchana* — Sa Ri_1 Ga_1 Ma_1 Da_1 Sa — Sa Da_1 Ma_1 Ga_1 Ri_1 Sa
Pa ,, — Sa Ri_2 Ma_1 Dha_1 Ni_1 Sa — Sa Ni_1 Dha_1 Ma_1 Ri_2 Sa
Dha ,, — Sa Ga_1 Pa Dha_1 Ni_1 Sa — Sa Ni_1 Dha_1 Pa Ga_1 Sa.

Shift of Modal Tonic in Shadava Ragas

Shadava-Shadava, Shadava-Audava, Audava-Shadava etc. come under this category of *Shadava ragas*.

Suddha Todi with Sa Ri_1 Ga_1 Ma_1 Da_1 Ni_1 Sa — Sa Ni_1 Da_1 Ma_1 Ga_1 Ri_1 Sa in the *arohanas avarohana* is the *Janya raga* of *Hamumathodi* (8). Its Ni *murchana* gives rise to *Pusba Latika* with Sa Ri_2 Ga_1 Ma_1 Pa Ni_1 Sa — Sa Ni_1 Pa Ma_1 Ga_1 Ri_2 Sa; in the arohana and *avarohana*. It is a Janya raga of Kharahara priya (22) (Refer table 1).

Suddhatodi is a *panchama Varja Shadava raga*, therefore from the principles of simple repetition (Murty P.S.N. *Sangeet Natak* Vol. 38, 1975), and the principles of complex repetition given in this article, it is not a repeating *raga*. Its parent *mela* is only *Hamumathodi*.

Whereas *Pushpalalika* can be derived from the following *Melakartas* by taking the notes underlined.

Sa *Ri_2* *Ga_1* *Ma_1* *Pa* *Dha_1* *Ni_1* *Ga* — *Arohana*) *Nathabhai-*
Sa *Ni_1* *Dha_1* *Pa* *Ma_1* *Ga_1* *Ri_2* *Sa* — *Avarohana*) *ravi* (20).
Sa *Ri_2* *Ga_1* *Ma_1* *Pa* *Dha_2* *Ni_1* *Sa* — *Arohana*) *Kharahara-*
Sa *Ni_1* *Dha_2* *Pa* *Ma_1* *Ga_1* *Ri_2* *Sa* — *Avarohana*) *priya* (29).
Sa *Ri_2* *Ga_1* *Ma_1* *Pa* *Dha_3* *Ni_2* *Sa* — *Arohana*) *Varuna*
Sa *Ni_2* *Dha_3* *Pa* *Ma_1* *Ga_1* *Ri_2* *Sa* — *Avarohana*) *Priya* (24).

Derivation from *Varunapriya* is a case of complex repetition.

Therefore a non-repeating shadava shavada raga by shift of model tonic can give rise to a repeating shadava raga. This repetitive raga can be of complex repetitive type also. This is also an interesting case.

The Ri *murchana* of *Pushpalithika* gives rise to *suddha todi*. Ri *murchana* of *Kharaharapriya* (22) gives rise to *Hanumathodi* (8) whereas *Nathabhairavi* (20) and *Varunapriya* are *anurchanakaraka melas* with respect to Ri.

Another example may be mentioned here. The *raga* is *chandrajyoti* with Sa Ri_1 Ga_0 Ma_2 Pa Dha_2 Sa — Sa Dha_2 Pa Ma_2 Ga_0 Ri_1 Sa, in the *arohana* and *avarohana* respectively. This is ranked under the *Janya ragas* of *Mela Pavani* (41). By principles of simple repetition it can be derived from *Mela Navanitham* (40) and from *Salagamu* (37) by complex repetition (Murty, P.S.N. Music Academy Journal, in press).

Sa	Ri_1	Ga_0	Ma_2	*Pa*	Dha_2	Ni_1	*Sa*	— *Arohana*	) *Navanitham*
Sa	Ni_1	Dha_2	*Pa*	Na_2	Ga_0	Ri_1	*Sa*	— *Avarohana*	) (40).
Sa	Ri_1	Ga_0	Ma_2	*Pa*	Dha_2	Ni_2	*Sa*	— *Arohana*	) *Pavani*
Sa	Ni_2	Dha_2	*Pa*	Ma_2	Ga_0	Ri_1	*Sa*	— *Avarohana*	) (41).
Sa	Ri_1	Ga_0	Ma_2	*Pa*	Dha_1	Ni_0	*Sa*	— *Arohana*	) *Salagamu*
Sa	Ni_0	Dha_1	*Pa*	Ma_2	Ga_0	Ri_1	*Sa*	— *Avarohana*	) (37)

By taking the underlined notes in the *arohana* and *avarohana* respectively *raga chandrajyoti* results. It is reminded once again that Nio = Dha_2.

Salagamu (37), *Navanitham* (40), *Pavani* (41) are *Amurochanakaraka* or sterile *ragas*. When shift of modal tonic is applied to various note of *chandrajyoti* it gives rise to the following *ragas*.

(i) Ri *Murchana* —Sa	Ri_1	Ma_1	Ma_2	Dha_1	Ni_2	Sa	— *Arohana.*
	Sa	Ni_2	Dha_1	Ma_2	Ma_1	Ri_1	Sa	— *Avarohana.*
(ii) Ga ,,	Sa	Ri_1	Ga_1	Ma_2	Pa	Ni_2	Sa	— *Arohana.*
	Sa	Ni_2	Dha_3	Pa	Ma_1	Ga_2	Sa	— *Avarohana.*
(iii) Ma ,,	Sa	Ri_1	Ga_1	Ma_2	Pa	Dha_1	Sa	— *Arohana.*
	Sa	Dha_1	Pa	Ma_2	Ga_1	Ri_1	Sa	— *Avarohana.*
(iv) Pa ,,	Sa	Ri_2	Ma_1	Ma_2	Pa	Ni_2	Sa	— *Arohana.*
	Sa	Ni_2	Pa	Ma_2	Ma_1	Ri_2	Sa	— *Avarohana.*
(v) Dha ,,	Sa	Ri_3	Ga_2	Ma_1	Dha_2	Ni_1	Sa	— *Arohana.*
	Sa	Ni_1	Dha_2	Ma_1	Ga_2	Ri_3	Sa	— *Avarohana.*

The Ri *murchana* of *Chandrajyoti* is a *raga* whose *Janaka mela* does not come under 72 *melas* but cooes under 108 *melas*.

The Ga *murchana raga* is a *Janya raga* of simple repetitive type. It can be derived from 3 *Melakartas*. The Ma *murchana raga* is a Janya *raga* of simple and complex repetitive type.

The Pa *Gurchana raga* does not belong to any of the known *Melakartas* namely 72 *males*, or 108 *melas* or 144 *melas* or 5,184 *melas*. In this *raga* both the *Madhyamas* and *Panchama* are present. The intervals are unmusical.

The Dha *murchana raga* is derived from *Melakarta Vagadhiswari* (34). It is a non-repeating *Janyaraga*.

Thus it could be seen that *Chandrajyoti having* 3 *Amurchana Karaka* parent *melas*, gives rise to new *ragas* by the *murchana* of its various notes. The new *ragas* are different types namely, non-repeating, simple repetitive, complex repetitive and unmusical *ragas* as well.

Amurchanakara Melas

Shift of modal tonic is otherwise known as *Grahabheda*. *Ragas* in general can be classified into

(1) Those wherein all its *swaras* give rise to new *ragas e.g. Mohana.* Such *ragas* may be styled as *Sarva Swara murchanakaraka ragas.*

(2) Those wherein some of the *swaras* alone give rise to new *ragas e.g. Kiravani.* These *ragas* may be styled *Katipaya Swara Murchanakaraka Ragas.* The *murchanakara melas* come only under this category (Sambhamurty, Vol.-V, 1963).

In other words *Katipaya Swara Murchanakaraka ragas* are sterile with respect to *murchana* on some notes. When shift of modal tonic is applied to such *ragas* no satisfactory *mela* results. Such scales are characterised by —

(1) Diminished fifths or
(2) Unmusical intervals or
(3) Four successive semitones or
(4) One of the *saptaswaras* going unrepresented.

A few of the examples will be considered here.

It could be seen that Ga *murchana* of *Harikanbhoji* (28), and *Vachaspati* (64) does not result in any of the 72 *Melakartas*. The Ga *murchana* gives rise to scales with the following notes.

Sa Ri_1 Ga_1 Ma_1 Ma_2 Dha_1 Ni_1 *Sa* — Ga *murchana of Harikambhoji* (28).

Sa Ri_2 Ga_1 Ma_1 Ma_2 Dha_1 Ni_1 *Sa* — Ga *murchana* of *Vachaspati* (64).

In the above two scales both the *Modhyamas* figures in, means the fifth note is diminished. Though both of these do not fall under 72 *mela* scheme, they fall under 108 *mela* scheme of Sambha Murty (p. 104 Book V.).

Except for the use of *Prati Madhyama* in the place of *Panchama,* the first *mela* is the equivalent of *Todi* and the second *mela* equivalent of *Nathabhairavi.*

Malkaus raga (Sa Ga_1 Ma_1 Da_1 Ni_1 Sa — Sa Ni_1 Da_1 Ma_1 Ga_1 Sa) eschewing Ri and Pa in the *arohana avarohana* which results by the Ga *murchana* of *Mohana raga*, can be derived from the two above scales which take both *Modhyamas*, by taking the notes underlined in the *arohama* and *avarohana* respectively.

The above is the case where parent melas of a raga fall under 108 *melas.*

Unmusical Scales in Shift of Modal Tonic

Shift of modal tonic of certain *ragas* in certain cases results in unmusical scales.

Madhyamavati and *suddha saveri* are considered here once again. results by the Ma *murchana* of *Madhyamavati.*

Madhyamavati by the principles of complex repetition can be derived from *Mela Tanarupi* (6) by taking the following notes.

Sa Ri_1 Ga_0 Ma_1 Pa Dha_3 Ni_2 Sa — Sa Ni_2 Dha_3 Pa Ma_1 Ga_0 Ri_1 Sa.

The underlined swaras in the *arohana* and *avarohana* will give rise to *Madhyamavati* because $Dha_3 = Ni_1$.

Tanarupi is a completely sterile or *A Gurchana karaka mela.* If its Ma is taken as tonic note the following scale results.

Sa Ri_2 Ma_1 Ma_2 *P* Dha_1 Ni_0 *Sa* — *Arohahana.*
Sa Ni_0 Dha_1 *P* Ma_2 Ma_1 Ri_2 *Sa* — *Avarohana.*

This is an unmusical scale, because Ma_1, Ma_2, P Dha1 Ni_0 are five successive notes.

But still *Suddha saveri* can be derived from this unmusical scale by taking the underlined notes in the *arohana* and *avarohana.*

Therefore the interesting point is an unmisical scale resulting from the Grahabheda on a particular note of a melakarta raga, can give rise to a musical upanga raga. This upanga raga also results by the grahabheda of the same note of an upanga raga derived from the Mela which was subjected to shift of modal tonic.

Similarly *Suddha Saveri* can be derived from *Kanakangi* as per the principles of complex repetition by taking the underlined notes in the *arohana* and *avarohana* respectively.

Sa Ri_1 Ga_0 Ma_1 *Pa* Dha_1 Ni_0 *Sa — Sa* Ni_0 Dha_1 *Pa* Ma_1 Ga_0 Ri_1 *Sa*

The *Pa murchana* of *Suddha Saveri* results in *Madhyamavati*. The Pa *murchana* of *Kanakargi* results in the following scale.

Sa Ri_1 Ga_0 Ma_1 Ma_2 *Pa* Ni_1 *Sa* — *Arohana.*
Sa Ni_1 *Pa* Ma_2 Ma_1 Ga_0 Ri_1 *Sa* — *Avarohana.*

This is also an unmusical scale because Ma1 Ma2 Pa are present which constitute unmusical intervals. By taking the underlined notes *Madhyamavat* results, which is otherwise derived by the Pa *murchana* of *Suddha Saveri.*

These two examples show that unmusical hepatonic scales can give birth to musical pentatonic ragas. Similarly it can be shown that unmusical scales can also give birth to musical shadava ragas.

Srutis in Shift of Modal Tonic

Ragas resulting by the shift of modal tonic need not possess the exact srutis required for that raga. In shift of modal tonic swarasthanas may be same, but subtle srutis need not be same. Some times diminishing or augmenting of the pitch of some notes is required. For example the Ri murchana of Dhira Sankarbharanam (29) *produces Kharahara priya Mela* (22). *It results only after diminishing and augmenting certain pitches of the resulting notes.*

It is beyond the scope of this article to discuss the diminishing or augmenting of pitch.

Shift of Modal Tonic in Hindusthani Ragas

The above principles discussed above hold good in Hindusthani music also. In Karnatak music *Sampurna ragas* are called *melas* or *melakartas ragas*, whereas in Hindusthani music they are called *thats*. *thats* are 72 in number in Hindusthani music though generally 10 *thats* are most frequently used. The names of *thats* and *melakarta ragas* are not same in Hindusthani and Karnatak musics.

As far as *Janya ragas* are concerned, *Bhupali* is the equivalent of *Mohana, Durga* is the equivalent of *Suddha Saveri. Raga Hamsadhwani* which are created by Rama Swamy Dikshitar father of Muthuswamy Dikshitar, was taken in Hindusthani music also with the same name.

The principles of shift of modal tonic, repetitive ragas, principles of complex repetition hold good in Hindusthani Music also. Only names of ragas are different in Hindusthani music for the corresponding ragas of Karnatak music.

Summary and Conclusions

(1) Some aspects of shift of modal tonic was dealt with result to *melakarta ragas* as well as *Janaka ragas* by late Prof. Sambha Murty.

(2) However the shift of modal tonic in relation to principles of simple and complex repetitions was not discussed by him.

(3) The definition of a complex repetitive *raga* and principles of complex repetition were discussed in some detail by the author.

(4) To determine the form of a *janya raga* from the shift of the tonic note Sambha Murty suggested certain method. Applying this method presents paradox in some cases. The paradox can be well understood, by applying applying principles of simple and complex repetition.

(5) A *murchanakaraka upanga raga* of repetitive nature common to number of *Janaka melas*, by shift of modal tonic may give rise to a *raga* having N number of parent *melas* e.g. *Madhyamavati* and *Suddha Saveri.*

(6) The resulting *upanga raga* may have more or less number of *Janaka melas* than the original *upanga raga* e.g. *Nagaswaravati* has 9 parent *melas* and *Hansadhwani* has only 6 *melas.*

(7) Some of the parent *melas* of an *Upanga raga* may be sterile or *Amurachanakaraka* in nature, and others are *Katipaya Murchanakaraka ragas*

(8) By shift of modal tonic a *melakarta* may give rise to a scale where both the *Madhyamas* without *Panchama* result. They fall under 108 *mel*x scheme of Prof. Samba Murty. Such *melas* can be parent *melas* for the *Upanga ragas* as illustrated in the text.

(9) Some of the *ragas* resulting by the shift of modal tonic of an *upanga raga* are not even named. A lot of scope exists for creating new *ragas.*

(10) By shift of modal tonic of some *melas*, some unmusical scales result which do not fall under *Melas* of any scheme like 72 *melas*, 108 *melas*, 144 *melas* or 5184 *mela scheme.* These scales have unmusical intervals but musical *upanga ragas* that are commonly used can be drived from them as illustrated.

(11) In *Shadava ragas* (This applies to *audava ragas* in special case) there can be *shadava ragas* of non repeating type, giving rise to *shadeva ragas* of repeating type. This repetition can be a simple repetition or a complex repetition. *Suddha Todi* and *Pushpa latika* are examples.

(12) An *upanga raga* of *audava* or *shadava* type can be derived from an *Amurchanakaraka* or sterile *mela*. But shift of modal tonic of its notes may give rise to *upanga ragas*. Some can be musical, and others need not *e.g. Chandrajyoti*.

(13) In the shift of modal tonic the resulting *raga* may have corresponding *swarasthanas* but they may not have the same subtle *srutis* characteristics of the *ragas*. The obtain correct *srutis*, either augmenting or diminishing the notes of the resulting *raga* has to be done.

(14) The above principles of shift of modal tonic in the case of *ragas* of simple and complex repetition hold good for Hindusthani music also. The only difference is that names of *melas* and *Janya raga* are different in Hindusthani and Karnatak Musics.

(15) Some of the points which appear as anomalies in the shift of modal tonic can be properly understood, when principles of simple and complex repetition are applied.

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